

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: August 8, 1996  
Date Received: August 1, 1996  
Project: 4700 Colorado Drum Solid ID  
Date Samples Extracted: August 1, 1996  
Date Extracts Analyzed: August 2, 1996

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE  
FOR TOTAL METALS BY  
INDUCTIVELY COUPLED PLASMA (ICP)  
(METHOD 6010)**

**Samples Processed Using Method 3050  
Results Reported as ug/g (ppm)**

<u>Sample ID</u>	<u>M54083</u>	<u>Method Blank</u>
Analyte:		
Arsenic	8	<5
Barium	20	<1
Cadmium	<1	<1
Chromium	11	<1
Lead	85	<2
Selenium	<5	<5
Silver	<1	<1

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**QUALITY ASSURANCE RESULTS FOR TOTAL METALS BY  
 INDUCTIVELY COUPLED PLASMA (ICP)  
 (METHOD 6010)**

Laboratory Code: 71153(Duplicate)

Analyte:	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Arsenic	ug/g (ppm)	8	10	22a	0-20
Barium	ug/g (ppm)	74	77	4	0-20
Cadmium	ug/g (ppm)	32	32	0	0-20
Chromium	ug/g (ppm)	150	150	0	0-20
Lead	ug/g (ppm)	520	520	0	0-20
Selenium	ug/g (ppm)	<5	<5	nm	0-20
Silver	ug/g (ppm)	4	4	0	0-20

Laboratory Code: 71153 (Matrix Spike)

Analyte:	Reporting Units	Spike Level	Sample Result	% Recovery MS	% Recovery MSD	Acceptance Criteria	Relative Percent Difference
Arsenic	ug/g (ppm)	100	8	98	95	50-150	3
Barium	ug/g (ppm)	50	74	ai	ai	50-150	ai
Cadmium	ug/g (ppm)	50	32	98	96	50-150	2
Chromium	ug/g (ppm)	50	150	ai	ai	50-150	ai
Lead	ug/g (ppm)	100	520	ai	ai	50-150	ai
Selenium	ug/g (ppm)	100	<5	99	99	50-150	0
Silver	ug/g (ppm)	20	4	77	77	50-150	0

Laboratory Code: Spike Blank

Analyte:	Reporting Units	Spike Level	% Recovery MS	% Recovery MSD	Acceptance Criteria	Relative Percent Difference
Arsenic	ug/g (ppm)	100	99	99	80-120	0
Barium	ug/g (ppm)	50	111	107	80-120	4
Cadmium	ug/g (ppm)	50	112	112	80-120	0
Chromium	ug/g (ppm)	50	108	108	80-120	0
Lead	ug/g (ppm)	100	112	113	80-120	1
Selenium	ug/g (ppm)	100	107	106	80-120	1
Silver	ug/g (ppm)	20	95	93	80-120	2

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

a - The analyte was detected at a level less than five times the detection limit. The RPD results may not provide reliable information on the variability of the analysis.

ai - The amount spiked was insufficient to give meaningful recovery data.

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Date of Report: August 8, 1996

Date Received: August 1, 1996

Project: 4700 Colorado Drum Solid ID

Date Samples Extracted: August 2, 1996

Date Extracts Analyzed: August 2, 1996

**RESULTS FROM THE ANALYSIS OF THE SOIL SAMPLE  
FOR TOTAL MERCURY BY COLD VAPOR AA**

**Samples Processed Using Method 7471A**

**Results Reported as  $\mu\text{g/g}$  (ppm)**

<u>Sample ID</u>	<u>Mercury</u>
M54083	0.04
Method Blank	<0.02



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ENVIRONMENTAL CHEMISTS

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**QUALITY ASSURANCE RESULTS  
 FOR MERCURY BY COLD VAPOR AA  
 (METHOD 7471A)**

Laboratory Code: 71175 (Duplicate)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Sample Result</u>	<u>Duplicate Result</u>	<u>Relative Percent Difference</u>	<u>Acceptance Criteria</u>
Mercury	µg/g (ppm)	0.04	0.04	0	0-20

Laboratory Code: 71175 (Matrix Spike)

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>Sample Result</u>	<u>% Recovery MS</u>	<u>% Recovery MSD</u>	<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
Mercury	µg/g (ppm)	0.3	0.04	103	107	50-150	4

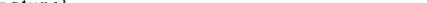
Laboratory Code: Spike Blank

<u>Analyte:</u>	<u>Reporting Units</u>	<u>Spike Level</u>	<u>% Recovery MS</u>	<u>% Recovery MSD</u>	<u>Acceptance Criteria</u>	<u>Relative Percent Difference</u>
Mercury	µg/g (ppm))	0.3	110	107	80-120	3



8-1-96  
11:25am

11:25am

DATE NO.	PROJECT NAME	PURCHASE ORDER #
	7700 Colonabo <sup>Solid</sup> <sub>Thin 770</sub>	M 54083

COLLECTORS (signature)	PROJECT LOCATION
	4700 Colorado

MARKS		SAMPLE DISPOSAL INFORMATION	
		<input type="checkbox"/>	Dispose after 30 days
		<input checked="" type="checkbox"/>	Return Samples
		<input type="checkbox"/>	Call for Instructions

SIGNATURE	PRINT NAME	COMPANY	Date	Time
Received by: 	GERALD THOMPSON	ACW	8-1-96	10:33
Received by: 	KURT JOHNSON	FB & I	8-1-96	10:46
Received by:				
Received by:				

FRIEDMAN & BRUYA, INC.

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ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D  
Beth M. Albertson, M.S.  
Bradley T. Benson  
Kelley D. Wilt

3012 16th Avenue West  
Seattle, WA 98119-2029  
TEL: (206) 285-8282  
FAX: (206) 283-5044

August 8, 1996

Gerry Thompson, Project Manager  
Alaskan Copper Works  
628 South Hanford  
Seattle, WA 98134

Dear Mr. Thompson:

Enclosed are the results from the testing of material submitted on August 1, 1996 from your 4700 Colorado Drum Solid ID project.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Kurt Johnson  
Chemist

keh  
Enclosures  
ACU0808R.DOC



FRIEDMAN & BRUYA, INC.

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August 8, 1996

**INVOICE # 96ACU0808-1  
DUPLICATE COPY**

Accounts Payable  
Alaskan Copper Works  
628 South Hanford  
Seattle, WA 98134

RE: Project 4700 Colorado Drum Solid ID: Results of testing requested by Gerry Thompson, Project Manager for material submitted on August 1, 1996.

1 soil sample analyzed for Total Metals  
by Method 6010 @ \$105 per sample

\$ 105.00

Amount Due .....

\$ 105.00